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PENSOFT

Chernes similis (Beier, 1932) (Pseudoscorpiones, Chernetidae) new to the fauna of Lithuania

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Abstract
The pseudoscorpion *Chernes similis* (Beier, 1932) is reported from the Baltic region for the first time. The new record from Lithuania is based on a single male specimen found in a mould growing in a hollow of a *Tilia* L. tree in the Botanical Garden of Vilnius University. This finding represents the northernmost record of *C. similis*. With the new record of *C. similis*, nine pseudoscorpion species, belonging to six genera and three families, are currently known from Lithuania.

Keywords
Baltic, botanical garden, distribution, faunistics, new record.

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Introduction

Chernetidae Menge, 1855 is a highly diverse pseudoscorpion family with over 650 species known worldwide (Harvey 2013). They occur in a variety of habitats including litter and upper soil layers, caves, tree microhabitats, and in specific association with other animals (Beier 1948, 1963; Turienzo et al. 2010; Christophoryová et al. 2017). In Europe, about 53 species and nine genera of Chernetidae have been recognized (Harvey 2013).

The fauna and species composition of Lithuanian pseudoscorpions are not fully studied. The first faunistic data were recorded only recently. Krajčovičová et al. (2018) published a summary of random collections sampled from various habitats in localities across the country. Eight species from three families and six genera have been documented to occur in Lithuania. The family Neobisiidae was represented by *Neobisium carcinoides* (Hermann, 1804) and *Neobisium crassifemoratum* (Beier, 1928), both with the occurrence at least in one of the neighbouring countries (Stol 2006; Sammet et al. 2016). A cosmopolitan species *Chelifer cancroides* (Linnaeus, 1758) was recorded as a single representative of the family Cheliferidae. The family Chernetidae with five species of four genera is the most species-rich in the country (Krajčovičová et al. 2018). Herein, another chernetid, *Chernes similis* (Beier, 1932), is reported from Lithuania for the first time. The type locality of *C. similis* (originally described in *Allochernes*) is in Romania, but this species is also known from Austria, Bulgaria, the Czech Republic, Hungary, Montenegro, North Macedonia, Poland, Slovakia, and Turkey (Novák 2012; Harvey 2013).

The aims of this work are to present the first known

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occurrence of *C. similis* in Lithuania, to compare the main morphological characteristic of this species with other known *Chernes* species in the Baltic region, and to show the distribution patterns of *C. similis*.

Methods

A single male of *Chernes similis* was collected in the Botanical Garden of Vilnius University, Lithuania (Fig. 1). The mould from a hollow of *Tilia* L. tree growing in an old linden alley was taken and extracted in Tullgren funnels. The hollow of the tree was near the ground.

The specimen examined for this study has been preserved in 75% ethanol. It was studied as temporary slide mount, prepared by immersing the specimen in lactic acid for clearing. After the study, it was rinsed in water and returned to 75% ethanol. Morphological and morphometric analyses were performed using a Leica DM1000 compound microscope with an ICC50 Camera Module (LAS EZ application, 1.8.0). Measurements were taken from digital images using the AxioVision 40LE application. Digital photographs (Fig. 2) were taken using a Canon EOS 5D Mark II camera attached to a Zeiss Axio Zoom V16 stereomicroscope. Image stacks were produced manually, combined using the Zerene Stacker software and subsequently edited in Adobe Photoshop CC. The pseudoscorpion was identified using the key by Christophoryová et al. (2011). The nomenclature follows Harvey (2013). The material is deposited in the collection of the Kaunas T. Ivanauskas Zoological Museum (KZM).

Results

Chernetidae Menge, 1855

***Chernes similis* (Beier, 1932)**

New record. LITHUANIA • 1 ♂; Vilnius, the Botanical Garden of Vilnius University (Fig. 1); 54.6823°N, 025.2324°E, 133 m a.s.l.; Povilas Ivinskis, Jolanta Rimšaité leg.; 15 July 2019; hollow in a *Tilia* tree; KZM BP-0630.

Identification. *Chernes similis* bears the main diagnostic characteristics of the genus (Fig. 2): carapace longer than broad, granulated, with two transverse furrows; no eyes present; body and palpal setae short, dentate, and clavate; the number of accessory teeth of chelal fingers not reduced; only moveable finger with venom apparatus; female spermatheca paired with long and thin tubes (Beier 1963; Christophoryová et al. 2011).

In the Baltic region, two other *Chernes* species occur: *C. cimicoides* (Fabricius, 1793) in Latvia, Lithuania, and Estonia, and *C. hahnii* (C.L. Koch, 1839) in Lithuania (Harvey 2013; Sammet et al. 2016; Krajčovičová et al. 2018). In *C. cimicoides*, tergite XI bears a pair of tactile setae (missing in *C. similis*) and the palps and carapace

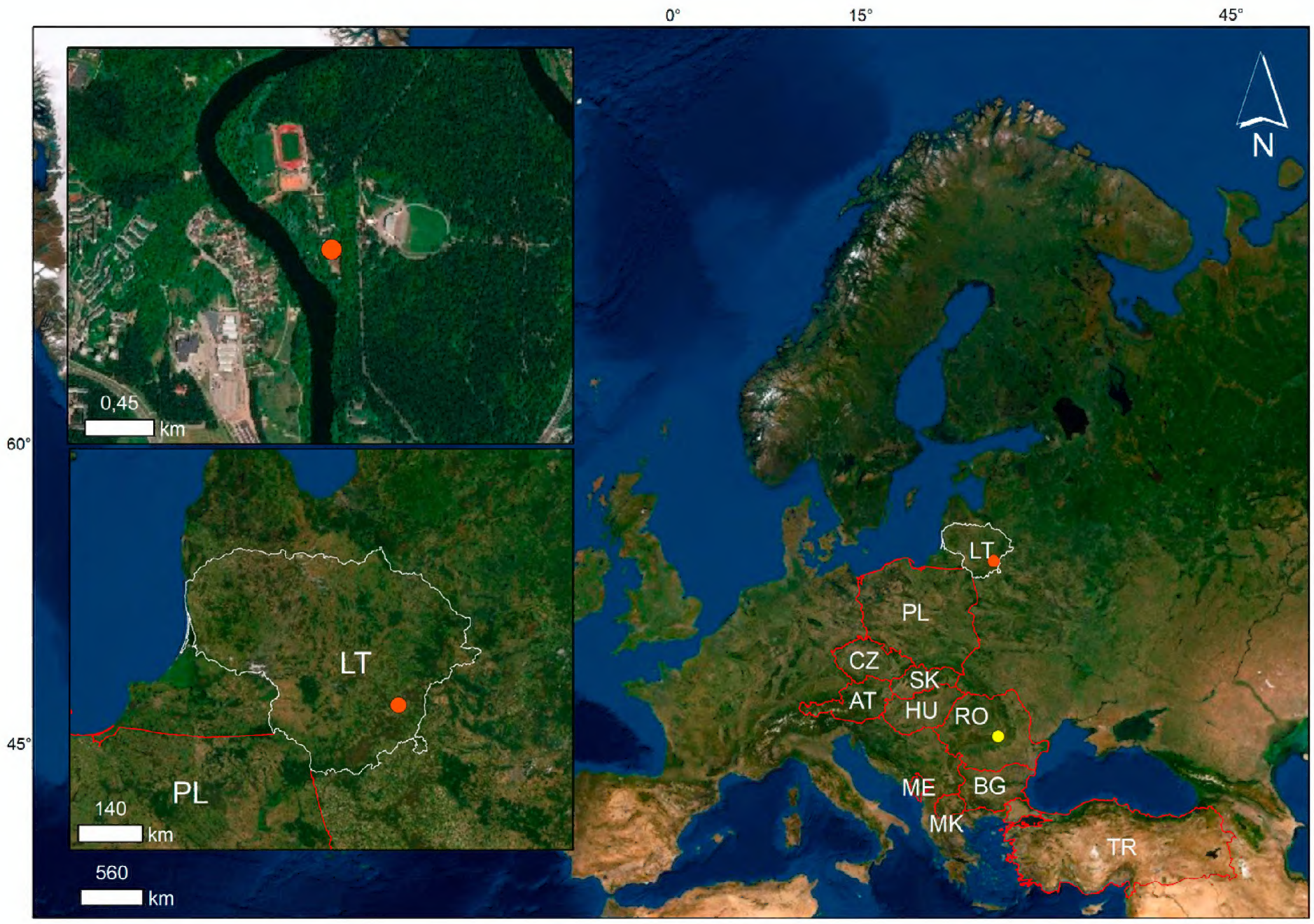

Figure 1. Distribution of *Chernes similis* in Europe (red border = published distribution, white border = new distribution, yellow circle = type locality, orange circle = present record).

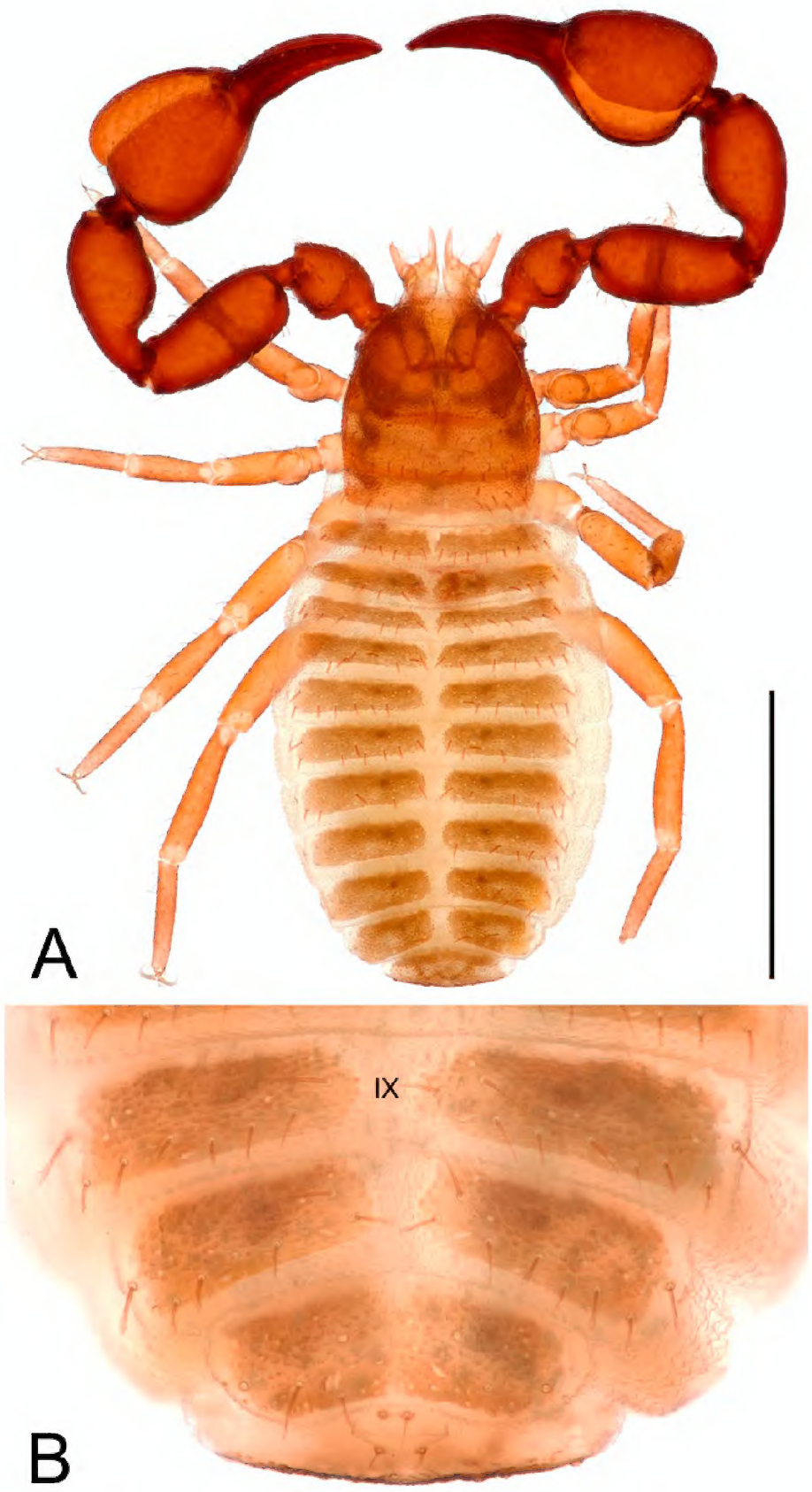

Figure 2. *Chernes similis*. **A.** Male, dorsal view (both chelal hands partly damaged). **B.** Chaetotaxy of sternite IX, ventral view. Scale bar = 1 mm.

are ornamented with a honeycomb pattern (granulated in *C. similis*, Fig. 2A) (Christophoryová et al. 2011). *Chernes similis* and *C. hahnii* share common characteristics, such as tergite XI is without tactile setae, and chelal finger is shorter than palpal hand with pedicel. They differ in setae type on sternite IX, in *C. hahnii* sternite IX bears only acuminate setae, but in *C. similis* there are mainly clavate setae present (Fig. 2B) (Christophoryová et al. 2011).

A short description of the examined male is here added: body length 2.36 mm; palpal femur length/width 0.64/0.27 mm; palpal patella length/width 0.62/0.28 mm; chelal hand/moveable finger length 0.61/0.55 mm. Number of chelal teeth (marginal/antiaxial/paraxial): fixed finger: 36/8/6; moveable finger 37/5/6.

Discussion

Chernes similis is distributed in 11 countries (Fig. 1) stretched across central and southeastern Europe (Novák 2012; Harvey 2013). The southernmost record lies in Turkey (Beier 1963), and the new record in Lithuania represents the northernmost one (Fig. 1). The first published data on *C. similis* from Romania does not specify the habitat (Beier 1932). Hadži (1938) recorded *C. similis* from the Zoological Garden in North Macedonia, where it was found in a nest washed up after the flood. Later, Hadži (1939) and Ćurčić (1974) documented this species' distribution in Bulgaria and Montenegro, but they did not mention the habitat type. Petrov (1997, 2004) published the findings of *C. similis* under tree bark in Bulgaria. In Austria, the species was sampled from leaf litter and deadwood, under tree bark, and in a chink of a block of wood (Beier and Franz 1954; Ressl 1970). Beier (1963) mentioned the distribution of the species in eastern Europe and Turkey to Alps region, where it lives in litter, nests, and anthills of *Camponotus* Mayr, 1861. Besides the anthills, Rafalski (1967) found the species in rock cavities and leaf litter in Poland. Few records of *C. similis* are known from Slovakia, where it was collected in bird boxes, leaf litter, and even in a cave (Krumpál 1980; Krumpál and Cyprich 1988; Krumpálová and Krumpál 1993; Christophoryová 2013; Šťáhlavský and Dolejš 2019). The reports from the Czech Republic and Hungary demonstrate the already known habitat preferences of this species: under tree bark, stones, and deadwood, and in leaf litter (Šťáhlavský 2006; Novák 2012; Šťáhlavský and Chytil 2013). Beier and Franz (1954), Rafalski (1967), and Šťáhlavský (2006) mentioned that the species lives in dry habitats.

The present data improves our knowledge on the distribution of *Chernes similis* and, simultaneously, a new habitat for this species is discovered.

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Authors' Contributions

KK identified the specimen, wrote the manuscript, and, in collaboration, created the map. PI and JR collected the specimen. JCH measured and photographed the specimen and revised the text.

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